

**REMARKS**

**Summary of the Office Action**

In the Non-Final Office Action dated March 11, 2002, the drawings stand objected to because the first and second substrates of claims 1 and 8 are allegedly not shown. Claims 1-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over “A New Wide-Viewing-Angle VA-Mode LCD with a Simpler Cell Fabrication Process” to Rho et al. (hereinafter *Rho*) in view of U.S. Patent No. 6,067,140 to Woo et al (hereinafter *Woo*).

**Summary of the Response to the Office Action**

Applicants have amended the drawings and the specification to correct the minor informalities indicated by the Examiner. Applicants have amended claims 1, 4 and 8. Claim 3 has been canceled without prejudice or disclaimer. Claims 1, 2, and 4-14 remain pending in this application, and are currently under consideration.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned “**Version with Markings to Show Changes Made.**”

**The Drawings**

In the Non-Final Office Action dated March 11, 2002, the drawings stand objected to because the first and second substrates of claims 1 and 8 are allegedly not shown. In a Request for Drawing Changes filed concurrently herewith, Applicant’s propose to amend the drawings to

illustrate a first and a second substrate as indicated by the Examiner. Accordingly, Applicants respectfully request that the objections to the drawings be withdrawn.

**The Rejection under 35 U.S.C. §103**

Claims 1-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over “A New Wide-Viewing-Angle VA-Mode LCD with a Simpler Cell Fabrication Process” to Rho et al. (hereinafter *Rho*) in view of U.S. Patent No. 6,067,140 to Woo et al (hereinafter *Woo*).

To the extent that the Examiner may consider this rejection to apply to the newly amended claims, the rejection is traversed as being based upon a combination of references that neither teach nor suggest the novel combination of features now recited in amended independent claims 1, 4 and 8, and hence, dependent claims 2, 5-7 and 9 -14.

Claim 1, as amended recites a liquid crystal display device combination including, “at least one light-shielding layer below each slit pattern.” Claim 8, as amended, recites a method of fabricating a liquid crystal display device including “forming a first electrode on the first substrate, the first electrode having a plurality of slit patterns over the light-shielding layer.”

The Office Action relies upon Fig. 1, page 159 of *Rho* for an alleged teaching of a liquid crystal device (LCD). The Office Action alleges that the LCD comprises a pair of substrates, a first transparent electrode on the first substrate having a plurality of slits (1 and 5) so that the liquid crystal layer has different alignment directions in each slit pattern. The Office Action further alleges that the LCD comprises a second transparent electrode on the second substrate, and a liquid crystal layer between the two substrates.

The Examiner recognizes that *Rho* fails to teach at least one light-shielding layer below the first electrode, the light-shielding layer located below the middle portion of the first electrode and below each slit, and an insulating film on an entire surface of the first substrate. The Examiner relies upon *Woo* to cure such deficiencies.

*Woo* discloses a liquid crystal display comprising, amongst other elements, a first substrate 101, a gate insulating layer 115, a metal layer 130, a pixel electrode 121, a data bus line 109, a second substrate 102, a shielding layer 111 and a color filter layer 123. *Woo* also teaches that each pixel is divided into 4-domains, and that each domain may have a different alignment direction from the other. *Woo* also teaches that in the boundary regions between the neighboring domains, an opaque metal layer 100 prevents the transmission of light through these boundary regions. *Woo* further discloses that the boundary regions of the domain are formed by the alignment layers having different alignment directions.

Contrary to *Woo*, the boundary regions of the present invention are formed by the electric field induced by the slit pattern. Therefore, although *Woo* discloses a metal layer 100 formed between the neighboring domains that prevents light leakage, the boundary regions of the domains are formed by the alignment layers having different directions, and not by the electric field induced by the slit pattern as in the present invention.

Accordingly, Applicants respectfully submit that there is no motivation to combine *Rho* in view of *Woo* to teach, or fairly suggest, a liquid crystal display device wherein the boundary regions of the domains are formed by the electric field induced by the slit pattern.

Applicants respectfully submit that the only motivation to form the features recited in newly amended claims 1 and 8 is found in the Applicants' own application. MPEP §2141

instructs that “the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention.” MPEP §2143 instructs that “the teachings or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant’s disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ 1438 (Fed. Cir. 1991).” The Federal Circuit has clearly held that “the motivation to combine references cannot come from the invention itself.” Heidelberger Druckmaschinen AG v. Hantscho Commercial Products, Inc., 21 F.3d 1068, 30 USPQ 2d 1377 (Fed. Cir. 1993).

Thus, Applicants respectfully submit that the Office Action has not established a *prima facie* case of obviousness and that the rejection of claims 1 and 8 under 35 U.S.C. §103(a) should be withdrawn. Additionally, Applicants respectfully assert that claims 2, 5-7, and 9-14 are allowable at least because of their dependence upon claims 1 and 8. Allowance of claims 1, 2, and 5-14 is therefore respectfully requested.

Applicants have also amended claim 4. Newly amended independent claim 4 recites a liquid display device combination comprising amongst other elements “at least one light-shielding layer below the first electrode and the slit pattern.”

As discussed above, the boundary regions of the present invention are formed by the electric field induced by the slit pattern, contrary to *Woo* wherein the boundary regions are formed by alignment layers. Therefore, although *Woo* discloses a metal layer 100 formed between the neighboring domains that prevents light leakage, the boundary region of the domains is formed by the alignment layers having different directions, and not by the electric field induced by the slit pattern as in the present invention. Thus, Applicant’s respectfully submit that neither *Rho* nor *Woo* taken either singularly or combined teach or fairly suggest the

claimed features of newly amended independent claim 4. Allowance of claim 4 is therefore respectfully requested.

**CONCLUSION**

In view of the foregoing remarks, Applicants respectfully request reconsideration of this application, withdrawal of all rejections, and the timely allowance of all pending claims 1, 2 and 4-14.

Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicant's undersigned representative to expedite the prosecution.

**EXCEPT** for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0310. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,  
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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION:**

Paragraph [0038] has been rewritten as follows:

[0038] As shown in FIG. 3, the LCD device of the present invention includes first 1 and second 2 transparent substrates ~~{(both not shown)}~~ opposing each other and a first transparent electrode 22 having a plurality of slit patterns 21 at a constant distance on the first substrate. The slit patterns 21 in the present invention are shown as a discontinuity in the pixel electrode (or the first transparent electrode 22). A second transparent electrode 23 is formed on the second 2 transparent substrate opposing the first transparent electrode 22. Liquid crystals 24 are aligned to oppose each other by the slit patterns 21 between the first and second transparent electrodes 22 and 23. A black matrix (light-shielding layer) 25 is located below the first transparent electrode 22 at the center of the first substrate.

Paragraph [0044] has been rewritten as follows:

[0044] As shown in FIG. 5, the LCD device according to the second embodiment of the present invention includes first 1 and second 2 substrates ~~{(not shown)}~~ opposing each other and a first transparent electrode 22 having slit patterns at a constant distance on the first substrate. A second transparent electrode 23 is formed on the second 2 substrate opposing the first transparent electrode 22. Liquid crystals 24 are aligned to oppose each other by the slit patterns 21 between the first and second transparent electrodes 22 and 23. A black matrix 25 is formed below the slit patterns 21.

Paragraph [0047] has been rewritten as follows:

[0047] As shown in Fig. 6, the LCD device according to the third embodiment of the present invention includes first 1 and second 2 substrates [~~not shown~~] and a first transparent electrode 22 having slit patterns 21 at a constant distance on the first substrate. A second transparent electrode 23 is formed on the second substrate 2 opposing the first transparent electrode 22. Liquid crystals 24 are aligned to oppose each other by the slit patterns 21 between the first and second transparent electrodes 22 and 23. A black matrix 25 is formed below the first transparent electrode 22 and below the slit patterns 21 to shield lights.

**IN THE CLAIMS:**

Claim 3 has been canceled without prejudice or disclaimer.

Claims 1, 4 and 8 have been amended as follows:

1. (Amended) A liquid crystal display device comprising:
  - a first electrode on a first substrate having a plurality of slit patterns;
  - a second electrode on a second substrate;
  - a liquid crystal layer between the first and second substrates, the liquid crystal layer having different alignment directions by each slit pattern; and
  - at least one light-shielding layer below ~~the first electrode~~ each slit pattern.
  
4. (Amended) ~~[The device as claimed in claim 1, wherein the ]~~ A liquid crystal display device comprising:  
a first electrode on a first substrate having a plurality of slit patterns;

a second electrode on a second substrate;  
a liquid crystal layer between the first and second substrates, the liquid  
crystal layer having different alignment directions by each slit pattern; and  
at least one light-shielding layer {is located} below {both} the first electrode and  
the slit patterns.

8. (Amended) A method of fabricating a liquid crystal display device on first and second substrates, comprising:

forming at least one light-shielding layer on the first substrate;

forming a first electrode on the first substrate, the first electrode having a plurality of slit patterns over the light-shielding layer {including the first substrate};

forming a second electrode on the second substrate;

assembling the first and second substrates; and

forming a liquid crystal layer having different alignment directions by each slit pattern between the first and second substrates.